

KEEP TABS ON KEY GROWTH STAGES

SITUATION

It can be difficult to schedule irrigation, herbicide application and harvest if you don't have a good handle on corn maturity. Identifying the milkline and blacklayer will help gauge the stage of corn growth and estimate physiological maturity.

FACTORS TO CONSIDER

- Tasseling
- Growing Degree Units (GDUs)
- Milkline Developmental Progression
- Blacklayer

ACTION PLAN

1. Record tasseling date. Corn matures roughly 55 to 60 days after tasseling. There are various stages in the maturation process, and knowing when tasseling occurs can help estimate when corn will mature.

2. Consider daily temperatures. The stages of kernel development depend on the amount of heat accumulation or GDUs. The GDU formula is commonly used as a guide to predict physiological maturity. For corn, GDUs are computed using this formula:

$$\text{GDU} = [(\text{maximum temperature} + \text{minimum temperature}) / 2] - 50$$

3. Observe the milkline. Break an ear of corn in half and look at the cross-section of the top half of the ear. The layer between hard starch and dough layers is the milkline. The progression of the milkline as it relates to the timing of blacklayer development is very important to irrigation scheduling and application of preharvest herbicides. Growers may reduce grain yield if they terminate irrigation or apply a harvest aid too early. It generally takes about 20 days for the milkline to progress from the kernel tip down to the base. Growers can use this guideline to estimate maturity. For instance, if the milkline is halfway down the kernels, it will take about another 10 days to reach physiological maturity. This field needs continued irrigation and should not have a harvest aid applied for 10 more days.

4. Recognize the blacklayer. A blacklayer or brown layer forms when the hard starch layer reaches the kernel base. Physiological maturity is signified by this line, or blacklayer. The blacklayer cuts off water and dry matter transfer into the kernel. At this stage, kernels have a moisture content of about 28 percent to 35 percent. The blacklayer is at the kernel base on the opposite side of the embryo and moves from kernels at the tip of the ear to the base. To find the blacklayer, shell kernels from an ear and gently scrape away the seed coat to expose it.

SUMMARY

Monitor stages of corn development to estimate maturity and properly determine timing for herbicide application, irrigation and harvest. Being able to recognize the milkline and blacklayer allow you to make adjustments in case of early frost or excessive moisture.

Table 1. Relationship Between Kernel Growth Stage and Development

Stage	Calendar Days to Maturity (Average)	Growing Degree Units (GDUs to Maturity)	Percent of Maximum Yield		Moisture Content	
			Grain	Whole Plant	Grain	Whole Plant
Silk (R1)	50-55	1,100-1,200	0	50-55	—	80-85
Blister (R2)	40-45	875-975	0-10	55-60	85-95	80-85
Late Milk-dough (R4)	30-35	650-750	30-50	65-75	60-80	75-80
Early Dent (R5)	20-25	425-525	60-75	75-85	50-55	70-75
Fully Dented (5.50-5.75)	10-15	200-300	90-95	100	35-40	65-70
Physiological Maturity (R6)*	0	0	100	95-100	25-35	55-65

*Blacklayer formation and/or milk disappearance from kernels under development. Premature frost or extended cold temperatures may cause blacklayer formation at earlier stages and wetter moistures.

AgronomyServices
Precision. Product. Placement.

Table 1 derived from the [University of Wisconsin Extension](#).

www.mycogen.com *The Mycogen Logo is a trademark of Mycogen Corporation. "Science. Yield. Success." is a trademark of Dow AgroSciences LLC. ©2011 Mycogen Seeds. Mycogen Seeds is an affiliate of Dow AgroSciences LLC. S47-137-035 010-12795 BR (5/11) MYCOGENL0076 EC

